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World Survey of Civil Aviation

THE NORDIC AREA

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- Finland
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- Norway
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World Survey of Civil Aviation

The Nordic Area

Denmark • Finland • Iceland

Norway • Sweden

1962

U.S. DEPARTMENT OF COMMERCE
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Foreword

This is the eighth in a series of foreign market surveys of civil aircraft and aeronautical products. Previous publications have covered Japan; Africa; Southwest Asia; the Near and Middle East; selected Asian countries and Oceania; Mexico, Central America, and the Caribbean area; and South America. The series discusses aircraft fleet composition and commercial and general flight operations. Special emphasis is given to market potential, trade and investment opportunities, and competitive factors affecting the sales of U. S. aircraft and aeronautical products.

Special appreciation is extended to the following members of the U. S. Foreign Service who supplied the basic data:

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The Nordic Area: An Overall View

The Nordic Area--consisting of Denmark, Finland, Iceland, Norway, Sweden, and the Danish possessions of Greenland and the Faeroe Islands--contains about 1.3 million square miles, a little more than one-third the area of the United States, and has a population of approximately 20.3 million. The topography is mostly mountainous, and there are many forests and rivers or lakes. Because of the influence of the Gulf Stream, the weather is less severe than might be expected in such a northern latitude, but snow does cover the ground a good part of the year.

The economies of the various countries are highly developed; Sweden's is the most industrialized, and Iceland's, which depends chiefly on fishing, is the least advanced.

THE ROLE OF AVIATION IN THE NORDIC AREA'S FUTURE

The keystone of civil aviation in the Nordic Area is the Scandinavian Airlines System (SAS), the area's major scheduled international airline. SAS is owned by a consortium of private and government interests in Sweden, Norway, and Denmark, and through a pooling of resources has been able to compete with the large commercial airlines of other countries.

Although SAS has been having financial difficulty, mainly because of its conversion to jet operations, it is believed that this situation is being overcome; in 1961 SAS losses were only about half the amount expected. The three governments are backing the consortium by loans, grants, and increased capital investment. It therefore appears that SAS is basically sound and will continue to be one of the leading European international airlines.

Charter flying, the fastest growing type of air travel in the area, is expected to increase. A number of companies, including SAS, now offer such service.

Iceland and Finland have the highest volume of flying per capita of all European countries. Both domestic and international flights are important means of transportation in these countries and will be of even greater importance in the future. Domestic flying in the three Scandinavian countries has been limited in the past but is now gaining on rail transportation, and its prospects are bright for even more rapid growth.

AIRCRAFT MANUFACTURING

Sweden, the only country in the Nordic Area that manufactures an appreciable number of aircraft, has two producers: the newly established *A.B. Malmo Flygindustri*, which produces light aircraft, and *Svenska Aeroplan Aktiebolaget* (SAAB), which primarily produces military aircraft.

AIRCRAFT IN USE

Approximately 1,175 aircraft, mostly U. S. built, are in use in the Nordic Area. Approximately 140 are used by scheduled airlines, and about 300 are operated by charter companies. The remainder, many of them single-engined Piper models, are used in general aviation.

MARKET POTENTIAL

U. S. exports of aircraft and aircraft engines to the Nordic Area totaled $2.6 million in 1959, $41.2 million in 1960, $5.2 million in 1961, and $12.3 million in the first half of 1962. The U. S. will probably continue to be the principal supplier, but competition is increasing from West Germany and Great Britain in the sale of light planes.

SAS's conversion to jets accounted for the high value of U. S. exports to this area in 1960. Because conversion is now completed, the sale of a large number of U. S. jet aircraft in the next few years appears extremely doubtful. The market for surplus long-range piston aircraft is limited at present because of the numbers displaced in the conversion to jets.

Helicopters and light utility aircraft appear to have a good market, especially in Finland, Norway, and Sweden. Short takeoff and landing aircraft (STOL) also will be in demand when their prices decrease.

No licenses for importing aircraft and parts are required by any of the Nordic countries, and only Norway imposes any type of duty.

Denmark

The Kingdom of Denmark is made up of Denmark proper, Greenland, and the Faeroe Islands. Denmark proper, composed of the Jutland Peninsula and about 500 small islands in the Baltic Sea, has an area of 16,575 square miles, more than twice that of Massachusetts, and a population of 4.6 million. Jutland Peninsula accounts for 11,575 square miles and 2 million people, and altogether the islands have an area of 5,000 square miles and a population of 2.6 million. The topography consists of flatlands, gently rolling hills, and a broad, sandy plain bordering Jutland's west coast. Because Denmark is almost completely surrounded by water, its climate is comparatively mild, and the west coast of the Peninsula is ice-free all winter. The economy is divided almost equally between agriculture and manufacturing. More than 12,000 square miles are devoted to agriculture. The principal manufactures are processed foods, iron and steel products, and machinery.

Greenland, the world's largest island, has an area of 840,000 square miles and a population of about 30,000. Having the world's greatest quantity of natural ice, the island is ice-free only in the summer in an area of about 132,000 square miles lying along the southernmost coast. Fishing and fish processing are the most important industries.

The Faeroe Islands, located about 200 miles north of Scotland, have an area of 540 square miles and a population of about 35,000. Their climate is inclement; fishing, fish processing, and sheep raising are the principal occupations.

ROLE OF AIR TRANSPORTATION

Domestic air services are limited in Denmark because of the highly developed surface transportation systems and the country's small size. The increasing international air traffic is served by Scandinavian Airlines System (SAS) and by a growing number of charter flights. The Danish Government owns half of the shares in *Det Danske Luftfartselskab A/S* (DDL), which, in turn, owns two-sevenths of SAS. To help offset SAS losses in 1961, the Government contributed the equivalent of U. S. $9.35 million to the SAS budget--$3.99 million as a direct grant, $2.83 million as a loan, and $2.54 million as an increase in DDL's capitalization. Denmark's six civilian airports, also owned by the Government, are operated by the Directorate of Civil Aviation.

No commercial aircraft are manufactured in Denmark at the present time, but about 15 amateurs have constructed their own planes. Until about 1957, *Skandinavisk Aero Industri A/S* produced a series of light aircraft.

AIRCRAFT IN USE

As of March 1, 1961, 172 aircraft were registered in the civil air fleet. Piper, Cessna, and Douglas models were the most popular of the approximately 50 U. S. planes listed in the register. The scheduled airlines had 22 aircraft, mostly U. S. and British. In general aviation activity, most of the planes are used for commercial and flying club purposes, and only a few are in private use. The most numerous type of plane listed was the *Skandinavisk Aero Industri* KZ models. About 90 sailplanes owned by various flying clubs were not included in the register.

COMMERCIAL AIRLINES

Service

Denmark has two scheduled airlines, Scandinavian Airlines System (SAS) and *Falcks Redningskorps*. (SAS is fully described under "Commercial Airlines" in the section of this report dealing with Sweden.) *Falcks Redningskorps* specializes in ambulance and rescue work, but also operates daily flights between Odense

and Copenhagen. Its air fleet consists of 1 Aero Commander 560, 2 DeHavilland Doves, 2 DeHavilland Herons, 1 DeHavilland Rapide, and 1 THK-5A.

Sixteen foreign flag carriers offer scheduled service, principally to Copenhagen. Among these are four Soviet Bloc airlines: C.S.A. (Czeckoslovakia), LOT (Poland), Malev (Hungary), and Aeroflot (U.S.S.R.). The only U. S. scheduled airline now providing service to Denmark is Pan American World Airways, Inc.

Disposal and Reequipment Programs

Falcks Redningskorps has no known disposal or reequipment programs.

GENERAL AVIATION

Of the 150 aircraft in general aviation activity, 44 are used in charter service, 46 in other types of commercial aviation, and 55 by the 16 motorized flying clubs. The remaining 5 are in private use.

Charter service, the most important form of general aviation activity, is still growing. Since 1959 five new companies have begun charter operations in Denmark: Nordic Airway A/S (Nordair), which purchased 3 DC-6's from United Air Lines; Danish Air Charter, which purchased 2 Vickers Viscounts from Air France; Flying Enterprise A/S, which purchased 4 Canadair C-4 Argonauts; Scandinavian Rent-a-Plane Service A/S, which purchased 2 Cessnas; and Scanair, the SAS charter company, which began operations in October 1961. In addition to these new Danish companies, Greenlandair recently commenced charter services in Greenland.

MARKET POTENTIAL

Although charter service is increasing in Denmark, the market potential for piston transport aircraft appears limited because of the surplus of this type available from SAS.

Helicopters and STOL aircraft could be of great value in both Denmark and Greenland, but are considered to be too expensive. "Bush operation" aircraft are needed in Greenland. For such use the Minister of Greenland has recommended DeHavilland Beavers or Otters and Consolidated Catalinas, but the Danish press has favored Dornier DO-28's as being better suited to Greenland's climatic conditions. The choice is not limited solely to these models, however, and, at present, other suitable aircraft would be considered. The U. S. Air Force, which has had considerable flying experience in Greenland, could, perhaps, offer pertinent information on performance requirements to prospective U. S. marketers.

No import duties or licensing restrictions are imposed on aircraft and parts.

Commercial airlines, total..... 22
- Scandinavian Airlines System (Danish registry only)
  - Convair 440..... 6
  - Douglas DC-7C..... 3
  - Douglas DC-8..... 2
  - Sud-Aviation S.E. 210 Caravelle (France)..... 4
- Falcks Redningskorps
  - Aero Commander 560..... 1
  - DeHavilland Dove (Great Britain)..... 2
  - DeHavilland Heron (Great Britain)..... 2
  - DeHavilland Rapide (Great Britain)..... 1
  - THK-5A (Turkey)..... 1

General aviation, total..... 150

Charter..... 44
- A/S Commertas
  - Cessna 172B..... 1
  - Cessna 175..... 1
  - Cessna 210..... 1
  - Stark Turbulent D (Germany)..... 1
- Danfly
  - Piper PA-18 Super Cub..... 1
  - Piper PA-22 Tri-pacer..... 1
  - Piper PA-25 Pawnee..... 1
- Danish Air Charter
  - Vickers Viscount (Great Britain)..... 2
- Esbjerg Aero Service
  - Cessna 172A..... 1
  - Scintex Emeraude (France)..... 2
  - Stark Turbulent D (Germany)..... 1
- Flying Enterprise A/S
  - Canadair C-4 Argonaut (Canada)..... 4

- Greenlandair (data not available)

- Mads Clausen
  - Airo Commander 560 E..... 1
  - Auster Autocrat (Great Britain)..... 1
  - Mooney Mark M-20A..... 2
  - Scintex Emeraude (France)..... 1
  - Skandinavisk Aero KZ-III (Denmark)..... 2
  - Skandinavisk Aero KZ-IV (Denmark)..... 1
  - Skandinavisk Aero KZ-VII (Denmark)..... 1
  - Tipsy Nipper (Belgium)..... 2
- Nordic Airway A/S (Nordair)
  - (Douglas DC-6..... 4

- Scanair (data not available)

- Scandinavian Rent-a-Plane Service A/S
  - Cessna 172A..... 1
  - Cessna 175A..... 1

General aviation, total--Con.	
Charter--Con.	
Transair	
Airspeed Consul (Great Britain)	2
Airspeed Oxford (Great Britain)	2
Beechcraft C-45H	1
Zone-Redningskorpset	
Lockheed L-12A	1
Monospar St. 25 (Great Britain)	1
Skandinavisk Aero KZ-III (Denmark)	1
Skandinavisk Aero KZ-IV (Denmark)	1
Skandinavisk Aero KZ-VII (Denmark)	1
Private, business, and flying clubs	106
Auster Autocrat D6/180 (Great Britain)	10
Avro Anson 652A (Great Britain)	1
Bell 47G	1
Cessna 150, 172, 172A, 175, 180	6
Dornier DO-27 (Germany)	2
Druine Turbulent (France)	3
Globe Swift	1
Hollaender AH-1 (Amateur)	1
Jodel D 112, D 120, Ambassadeur (France)	4
Messerschmitt Me. 108 (Germany)	2
Meta-Sokol L-40 (Czechoslovakia)	2
Noorduyn Norseman (Canada)	3
Percival Proctor (Great Britain)	4
Piper Cub, Tri-pacer, PA-18A, 22, 23, 25	10
Scintex Emeraude (France)	1
Skandinavisk Aero KZ-II T, -II Coupe, -III, -VII, X Mk. 2, -Ellehammer (Denmark)	52
Stark Turbulent D (Germany)	1
Stinson L-5B	1
Super Aero 45 (Czechoslovakia)	1

Finland

The Republic of Finland, the sixth largest country in Europe, has an area of 130,161 square miles, slightly greater than that of New Mexico, and a population of approximately 4.5 million. The topography is predominantly forest-covered lowlands and scattered lakes. Finnish summers are short and warm, the winters long and cold. Snow covers the ground in southern Finland for 110 days, in central Finland for 150 days, and in northern Finland (Lapland) for 200 days. Agriculture and forestry are the principal economic activities.

ROLE OF AIR TRANSPORTATION

Domestic air transportation has grown rapidly in Finland in the postwar period because of Government assistance, the inadequacy of the highway network (which is undergoing rapid improve-

ment), the size of the country, lowered fares, and the excellent safety and performance records of Finnish air carriers. International air transportation has also gained appreciably, largely because of the increasing popularity of charter flights.

Civil aviation is administered by the Office of Civil Aviation in the Ministry of Communications and Public Works. Since World War II the Government has assisted in the development of a national flag carrier. In 1946 it invested in a small private carrier, *Aero Oy* (Finnair), and now owns 73 percent of the company's capital stock. Government assistance to Finnair includes long-term, low-interest credits as well as guarantees for foreign credits, which are readily available to Finnair as a state-controlled corporation. In recent years Finnair has used such credits to finance the purchase of 4 Caravelle jet aircraft. The Government does not grant direct subsidies to the two national flag carriers, but it allows them to purchase fuel and lubricating oil used for domestic operations free of taxes and customs charges. The Government has also undertaken a program to improve Finland's nine international and nine local airports.

Finland is a member of the International Civil Aviation Organization (ICAO) and the *Institut du Transport Aerien* (ITA), and its airlines are members of the International Air Transport Association (IATA). Finland has concluded bilateral air agreements with nine countries, including the United States.

Aeronautical manufacturing is limited to assembly under French license of jet training aircraft for the Finnish Defense Forces. Finnair and *Veljekset Karhunaki Oy* are the only overhaul and maintenance firms of any size.

AIRCRAFT IN USE

At the beginning of 1962, 130 aircraft were registered in the civil air fleet, and 101 of these were airworthy. The scheduled airlines had 25 aircraft. In general aviation activity, 42 of the 105 aircraft registered were U. S. built; the most numerous makes, in order of popularity, were Cessna, Fairchild, Stieglitz (German), Piper, and Auster (British).

COMMERCIAL AIRLINES

Service

Aero Oy (Finnair) and *Kar-Air Oy* are Finland's two scheduled airlines. The Government owns 73 percent of the capital stock in Finnair, and the Finnish Steamship Co. and other private investors hold the remainder. Finnair's air fleet consists of 4 Convair 340/440's, 3 Convair 440's, 7 Douglas DC-3's, and 4 S.E. 210 Caravelles. The airline also has a pooling agreement with SAS. In addition to domestic service, Finnair provides international service to 10 European cities on its route network

Item	1958		1959		1960	
	Domestic	International	Domestic	International	Domestic	International
Kilometers flown.....	4,589,102	4,025,008	4,837,051	4,127,471	5,552,450	4,753,569
Passengers carried.....	262,181	132,754	264,749	137,062	310,376	185,968
Passenger kilometers available.....	130,686,356	172,126,897	131,310,819	177,285,092	161,046,744	271,334,388
Passenger kilometers flown	72,063,534	80,945,199	75,010,858	84,285,834	89,615,040	127,092,047
Passenger load factor.....	55.1%	47.0%	57.1%	47.5%	55.6%	46.8%
Cargo (1,000 kgs.).....	1,466.3	836.0	4,219.4	1,164.1	4,883.5	1,277.6
Mail (1,000 kgs.).....	356.0	438.4	345.7	437.5	542.5	591.5
Ton kilometers available...	13,433,346	19,745,447	15,313,036	20,591,955	19,459,430	29,491,194
Ton kilometers flown.....	6,496,554	8,485,071	7,675,269	9,217,030	9,622,179	13,350,782
Revenue weight load factor	48.4%	43.0%	50.1%	44.8%	49.4%	45.3%

of 7,250 miles. Comparative statistics for the period 1958-60 (latest available), shown in the accompanying table, illustrate Finnair's increasing importance as an air carrier.

The Finnish Steamship Co. and the overhaul and maintenance firm *Veljekset Karhunaki Oy* are the principal stockholders in *Kar-Air Oy;* private citizens own the rest. The company's air fleet consists of 2 Convair 440's, 4 Douglas DC-3C's, and 1 Lockheed Lodestar. Kar-Air has a Swedish subsidiary which owns 1 Douglas DC-6B. Primarily, Kar-Air conducts charter operations, having flights to various points in Europe (for the most part Italy, Spain, and France), to the Balearic and Canary Islands, and to the Middle East. In 1960 the company's total revenue from its aviation activities was approximately $1.7 million, of which regular passenger service accounted for 23 percent and charter flights for 52 percent. Group tours, freight, and geological survey flights made up the remainder.

Six foreign flag carriers offer scheduled service to Helsinki. Among these are C.S.A. (Czechoslovakia) and Aeroflot (U.S.S.R.). The only U. S. scheduled airline operating in Finland is Pan American World Airways, Inc.

Disposal and Reequipment Programs

Finnair will trade in its recently acquired four Caravelles on six new ones in 1965. The present Caravelles have replaced the company's Convair 440's on most of its international routes, and the 440's are now being used on domestic routes along with DC-3's, which the company plans eventually to replace with 440's. The DC-3 fleet, which has been reduced from 10 to 7 aircraft, will remain in service until all airfields are suitable for year-round operation of the Convairs.

Kar-Air plans to purchase a DC-6 for use, along with the one owned by its Swedish subsidiary, in charter operations to the United States and Europe.

GENERAL AVIATION

Charter flying is the most important form of general aviation activity. *Oy Lentorakti-Finlantic Ab* (Finlantic) has recently begun charter operations, using 2 DC-6B's; the scheduled airlines provide other charter services. Commercial flying--consisting of powerline patrolling, aerial photography and cartography, geographical exploration, mineral prospecting, ice patrolling, and air taxi service--is fairly important in Finland. At the beginning of 1962, commercial operators included 29 air taxi firms using 41 aircraft, and 2 flying clubs using 2 aircraft. The 14 flying clubs, operating 16 aircraft, provide instructional flying. Little business or private flying is done.

MARKET POTENTIAL

Finnair will eventually require aircraft of the Convair 440 type, but it has announced no specific purchase plans. Kar-Air purchased a used DC-6B in early 1961 and is looking for a second, but it has no immediate plans to purchase other aircraft. If the rapid increase in charter traffic continues, however, both Kar-Air and Finlantic may be interested in purchasing additional medium-range aircraft.

A limited, but continuing, need exists for new helicopters for air rescue work. This market is based on performance standards rather than on price alone. The most likely prospects for sales of utility aircraft are large forestry firms having widely separated branch offices or mills, provided these firms can be convinced of the advantages of executive flying. Other markets for small utility aircraft are the air taxi operators and flying clubs, which require replacement aircraft from time to time.

Finland's program to improve its airports will require additional communication, navigation, airways, and related equipment. Previous extensive use of U. S. products for such needs should lead to increased sales as the program develops. Aircraft and parts may be imported duty free without restriction.

Finnish Civil Air Fleet—130

Commercial airlines, total..... 25
- Aero Oy (Finnair)
  - Convair 340/440..... 4
  - Convair 440..... 3
  - Douglas DC-3..... 7
  - Sud-Aviation S.E. 210 Caravelle (France)..... 4
- Kar-Air Oy
  - Convair 440..... 2
  - Douglas DC-3..... 4
  - Lockheed Lodestar..... 1

General aviation, total..... 105
- Charter..... 2
  - Oy Lentorakti-Finlantic Ab (Finlantic)
    - Douglas DC-6B..... 2
- Air taxi..... 41
  - V. Asikainen ja P. Pelto
    - Sokol M1C (Czechoslovakia)..... 1
  - Finnwings Oy
    - Piper PA-18..... 1
  - Erkki ja Esko Hannuksela
    - Piper J-3C..... 1
  - Helikopteripalvelu
    - Bell 47D-1..... 1
  - Ilmakuvaus, Virtanen, & Veistera
    - Ercoupe..... 1
  - Erkki Jaakkola
    - Cessna 180..... 1
    - Fairchild..... 1

General aviation, total--Con.
Air taxi--Con.
Jack Johnsson
Piper J-2..... 1
Viljo Koistinen
Piper PA-18..... 1
Oy Kunnallistekniikka Ab
Pilatus Porter (Switzerland)..... 1
Pentti Kyrola
Fairchild..... 1
Keijo Kaariainen
Auster (Great Britain)..... 1
Skandinavisk Aero KZ-VII (Denmark)..... 1
K.Y. Lehti Oy
Cessna 170B..... 1
Lentohuolto Oy
Aero Commander 500..... 1
Cessna 140..... 3
Cessna 195..... 4
Lentomainos Oy
Fairchild..... 1
Ossi Marjanaki
Karhu 48 B (Finland)..... 1
J. Pallonen
Auster (Great Britain)..... 1
Tuomo Petajaniemi
Scintex Emeraude (France)..... 1
Juha Pulkkinen
Fairchild..... 1
Pentti Riitaoja
Noorduyn Norseman (Canada)..... 1
Pentti Salenius
Cessna 140..... 1
S. W. Sarkka
Viima II (Finland)..... 1
Tampereen Lentoliikenne Oy
Auster (Great Britain)..... 1
Tilauslento Oy
Fairchild..... 1
Skandinavisk Aero KZ-VII (Denmark)..... 1
Aarne Tirkkonen
Grumman G-44 Widgeon..... 1
Skandinavisk Aero KZ-VII (Denmark)..... 1
Urho Uusimaa ja Gunnar Vakkila
Viima II B (Finland)..... 1
A & E Vainikainen
Cessna 150..... 1
Cessna 170 B..... 1
Velj. Karhumaki Oy
Piper PA-18 "150"..... 1
Pentti Yletyinen
Auster Taylorcraft Plus D (Great Britain)..... 1
Yli-Vakkuri
Scintex Emeraude (France)..... 1

Flying clubs with commercial rights..... 2
- Lappeenrannan Ilmailuyhdistys r.y.
  - Piper PA-14..... 1
- Turun Lentokerho r.y.
  - Skandinavisk Aero KZ-VII (Denmark)..... 1

Other flying clubs..... 16
- Akateeminen Lentokerho r.y.
  - Zlin 381 (Czechoslovakia)..... 1
- Forssam Ilmailukerho r.y.
  - Stieglitz (Germany)..... 1
- Hameenlinnan Lentajat r.y.
  - Klemm 25 (Germany)..... 1
- Helsingin Ilmailuyhdistys r.y.
  - Klemm 25 (Germany)..... 1
- Helsingin Lentokerho r.y.
  - Stieglitz (Germany)..... 1
- Joensuun Ilmailukerho r.y.
  - Stieglitz (Germany)..... 1
- Jarvenpaan Ilmailukerho r.y.
  - Stieglitz (Germany)..... 2
- Kajaanin Ilmailukerho r.y.
  - DeHavilland DH 82A Tiger Moth (Great Britain)... 1
- Lahden Ilmailukerho r.y.
  - Stieglitz (Germany)..... 2
- Lentokerho Cosmos r.y.
  - Jodel Ambassadeur (France)..... 1
- Mikkelin Ilmailuyhdistys r.y.
  - PIK-II* (Finland)..... 1
- Nuorisoilmailijat r.y.
  - Tipsy Trainer (Belgium)..... 1
- Polyteknikkojen Ilmailukerho r.y.
  - PIK-II* (Finland)..... 1
- Rovaniemen Ilmailukerho r.y.
  - DeHavilland DH 82A Tiger Moth (Great Britain)... 1

Government, nonmilitary..... 6
- Rajavartiostojen Esikunta
  - DeHavilland (Canada) DHC Beaver..... 3
  - Mil Mi-1M (U.S.S.R.)..... 1
  - Zygmunt Pulawski SM-1S-600 (Poland)..... 2

Industry..... 5
- Enso-Gutzeit Osakeyhtio
  - Cessna 180..... 1
- Imatran Voima Oy
  - Bell 47D-1..... 1
  - DeHavilland (Canada) DHC Beaver..... 1
- Pohjolan Voima Oy
  - Fairchild..... 1
  - Republic RC-3 Seebee..... 1

Private..... 33
- Auster (Great Britain)..... 2
- Auster 5 (Great Britain)..... 1
- Beechcraft Baron..... 2
- Cessna 172..... 1
- Cessna 180..... 1

General aviation, total--Con.
Private--Con.

Eklund TE-1 (Finland)	1
Fairchild	3
Fieseler Storch (Germany)	1
Heinonen HK-1 (Finland)	1
Jodel Ambassadeur (France)	1
Junkers (Germany)	1
Klemm (Germany)	1
Kokkola JO-3 Gyrocopter (Finland)	1
Meta-Sokol L-40 (Czechoslovakia)	1
Moottoribaby (Amateur)	1
PZL-102 KOS** (Poland)	2
Percival Proctor (Great Britain)	1
Piper J-3C	2
SAAB Safir*** (Sweden)	1
Stieglitz (Germany)	2
Viima II (Finland)	4
Zlin 126-Trener (Czechoslovakia)	2

*Polyteknikkojen Ilmailukerho.
**Osrodek Konstrukcji Lotniczych.
***Svenska Aeroplan Aktiebolaget.

Iceland

The Republic of Iceland, an island lying midway between Greenland and Norway in the North Atlantic, has an area of 39,758 square miles, about that of Virginia, and a population of approximately 180,000. The topography consists of a large central plateau surrounded by mountains, some of which bear extensive glaciers. Several active volcanoes heat numerous springs. A branch of the Gulf Stream that flows around the island moderates its climate somewhat, but sudden changes in the weather are characteristic. Fishing is the major industry.

ROLE OF AIR TRANSPORTATION

The tremendous growth of air transportation in recent years has greatly increased mobility within Iceland and to other countries. Icelanders do more flying per capita than any other people in Europe. In 1960 the scheduled airlines carried approximately 125,000 passengers, a number equal to seven-tenths of the island's total population.

Civil aviation in Iceland is administered by the Civil Aviation Administration. CAA operates the two international airports, one of which, Reykjavik Airport, has recently been improved. Twelve local airports are in operation, and one other is under construction. Except for airport administration, the Government's

financial interest in civil aviation is limited to ownership of about $1,500 worth of stock in *Flugfelag Islands, h.f.* (Icelandair). Iceland is a member of the International Civil Aviation Organization (ICAO). No aircraft manufacturing or assembly is done.

AIRCRAFT IN USE

At the end of 1961, 59 aircraft were registered in the civil air fleet. The scheduled airlines had 12 aircraft, and 47 aircraft were in general aviation use--11 of them sailplanes operated by flying clubs. Of the remaining 38 planes, 23 were U.S. built. The most numerous makes of general aviation aircraft, in order of popularity, were Piper, DeHavilland, and Ercoupe.

COMMERCIAL AIRLINES

Service

Flugfelag Islands, h.f. (Icelandair), and *Loftleidir, h.f.* (Icelandic Airlines), are Iceland's two scheduled airlines. The largest single stockholder in Icelandair is the Icelandic Steamship Co., Ltd., the nation's major shipping line. Icelandair serves 21 Icelandic communities in addition to Oslo, Copenhagen, London, Hamburg, and Glasgow on its route network of 5,000 miles. Its air fleet consists of 3 DC-3's, 1 DC-4, 1 DC-6B, and 2 Vickers Viscounts.

Icelandic Airlines, privately owned, operates only international flights. It serves New York and nine European cities on its route network of 12,650 miles. Its air fleet consists of 5 DC-6B's. The airline is not a member of the International Air Transport Association (IATA), and its rates are below those of other airlines for the Reykjavik-New York portion of the trans-Atlantic crossing. The company has recently received permission from the Luxembourg Government to charge lower fares into that country.

Pan American World Airways, Inc., is the only foreign flag carrier regularly operating into Iceland.

DISPOSAL AND REEQUIPMENT PROGRAMS

Icelandair has announced no purchasing programs but may be interested in aircraft of the F-27 type in a few years. Icelandic Airlines recently purchased its fifth DC-6B, and is considering a sixth.

GENERAL AVIATION

At the end of 1961, 47 aircraft were in general aviation activity. Five organizations used 19 aircraft for air ambulance, air taxi, crop dusting, instructional, and other purposes. The largest of these, Flying School "Thytur," owned 11 aircraft. Two flying clubs operated 1 motor plane and 11 gliders. The remaining 16 aircraft were in private use.

MARKET POTENTIAL

Because of Iceland's small population, the market for aircraft is limited. General aviation is gradually increasing and offers a small market for additional and replacement aircraft. The fleets of the scheduled airlines are fairly stable for the present, but the companies would probably be interested in surplus piston aircraft at attractive prices.

Aircraft and parts may be imported duty free without license.

Icelandic Civil Air Fleet—59

Commercial airlines, total..... 12
- Flugfelag Islands, h.f. (Icelandair)
  - Douglas DC-3..... 3
  - Douglas DC-4..... 1
  - Douglas DC-6B..... 1
  - Vickers Viscount 759 (Great Britain)..... 2
- Loftleider, h.f. (Icelandic Airlines)
  - Douglas DC-6B..... 5

General aviation, total..... 47
- Commercial and rescue..... 19
  - Bjorn Paulsson & Assoc.
    - Beechcraft D-50..... 1
    - Cessna 180..... 1
  - Coast Guard
    - Convair PBY-6A..... 1
    - Douglas DC-4..... 1
  - Flugfelag Reykjavikur
    - DeHavilland D.H. 89A (Great Britain)..... 1
  - Flugsyn Ltd.
    - Cessna 140..... 2
    - Stinson..... 1
  - Flying School "Thytur"
    - Cessna 172..... 1
    - Ercoupe..... 1
    - Piper Apache..... 1
    - Piper Colt..... 1
    - Piper Cub J-3..... 5
    - Piper Super Cub..... 2

Flying Clubs..... 12
- The Gliding Club of Akureyri
  - Elliotts Olympia (Great Britain)..... 1
  - Grunau Baby (Germany)..... 1
  - TG-3A..... 1
- The Gliding Club of Iceland
  - Boeing Stearman..... 1
  - Grunau Baby (Germany)..... 3
  - Kockum Fi-1 (Sweden)..... 1
  - Schleicher Rhonlerche (Germany)..... 1
  - TG-3A..... 1
  - TG-4A..... 1
  - Weihe (Germany)..... 1

Private	16
Auster (Great Britain)	2
Cessna 180	1
DeHavilland Tiger Moth (Great Britain)	1
Ercoupe	3
Fleet Finch (Canada)	1
Minimoa	1
North American Harvard	1
Percival Proctor (Great Britain)	1
Piper Apache	1
Piper Cub Cruiser	1
Piper Cub J-3	1
Ryan Navion	1
Skandinavisk Aero KZ-111 (Denmark)	1

Norway

The Kingdom of Norway has an area of almost 125,000 square miles, slightly more than that of Arizona, and a population of about 3.6 million. The country is divided by a north-south range of mountains extending along the western side of the country and reaching highest altitudes in the west-central part. Of the country's total area, 75 percent is barren mountainous land, 21 percent is forest, and only 3 percent is cultivated.

Because of Norway's great length from south to north, the varying influence of the Gulf Stream, and the numerous mountains, the climate changes sharply from place to place. In general, summer, spring, and fall are short, and winter, which begins in October and lasts through the middle of April, is cold with abundant snowfall.

The dominant elements in Norway's economy are its merchant fleet and its export industries, which include fish and fish products, paper and pulp, aluminum, nickel, ferroalloys, and chemical fertilizers.

ROLE OF AIR TRANSPORTATION

Although the volume of traffic is gradually increasing, domestic air transportation is relatively unimportant in Norway. According to the *National Economic Accounts* for 1958, civil aviation's share of the gross national product was $14 million, less than 2 percent of the transportation total and only 0.3 percent of Norway's total GNP. In the period 1953-59, the last for which comparative statistics are available, air passenger traffic increased from 0.2 percent to 1.2 percent of the total domestic passenger-kilometer traffic. Comparative figures on passenger and freight entering and leaving Norway by air, rail, road, and sea are not available. Published data indicate that air passenger

traffic is increasing faster than other forms of commercial traffic, largely because of the increase in the number of charter flights, especially to Mediterranean vacation resorts. In the period 1955-59, charter flight traffic more than trebled, reaching 63 million passenger-kilometers.

The Ministry of Foreign Affairs, in cooperation with the Directorate of Civil Aviation, is responsible for furthering Norway's international aviation interests, and the Ministry of Communications governs Norway's internal aviation affairs through the Directorate of Civil Aviation.

The Government has substantial interests in civil aviation through its participation in Scandinavian Airlines System. It owns one-half of the shares in *Det Norske Luftfartsselskap* (DNL), which owns two-sevenths of SAS. In June 1961 the Storting (Parliament) appropriated the equivalent of $9.66 million as Norway's share to help SAS overcome its financial difficulties--$3.92 million as a direct grant, $2.94 million as a loan, and $2.80 million as an increase in the capitalization of DNL. In addition, the Storting subsidizes the operation of two scheduled passenger routes in north Norway, $230,000 being granted for this purpose in calendar year 1961, the same as for the two preceding fiscal budget periods. It also makes annual appropriations for construction, maintenance, and operation of airports and air navigation facilities. For calendar year 1961, the Storting granted $7.61 million to be used primarily for improving Norway's 10 international airports and its 5 other major civil airports.

Norway is a member of the International Civil Aviation Organization (ICAO) and such subordinate bodies as the European Civil Aviation Conference (ECAC) and the Committee on Coordination and Liberalization (COCOLI). The country is a signatory to the civil aviation conventions of Warsaw (1929), Rome (1933), Chicago (1944), Geneva (1948), and Paris (1956). Norway has concluded bilateral air agreements with 37 countries, including the United States, and is currently negotiating with 2 others.

There is no manufacture or assembly of aircraft in Norway and practically no production of communications, navigation, or airways and ground handling equipment. Maintenance of aircraft is done by the airlines.

AIRCRAFT IN USE

As of June 30, 1962, 231 aircraft were registered in the civil air fleet. More than half of these were U.S. makes. Other major suppliers of civil aircraft were the United Kingdom and Canada. The scheduled airlines had 36 aircraft, of which 15 were operated by SAS, 13 by *Wideroe's Flyveselskap A/S*, and 8 by Braathens South American and Far East Airtransport A/S. Other commercial uses such as nonscheduled, charter, taxi, photography, ambulance, etc., accounted for 68 aircraft, and private flying, including flying clubs, accounted for 127 aircraft.

COMMERCIAL AIRLINES

Service

Norway has three scheduled airlines: Scandinavian Airlines System (SAS), Braathens South American and Far East Airtransport A/S (SAFE), and *Wideroes Flyvelselskap A/S.* (SAS is described under "Commercial Airlines" in the section of this report dealing with Sweden.)

SAFE's 5-year concession for scheduled flights to Hong Kong was terminated March 1, 1954, because of the Government's commitment under the consortium agreement to support SAS when it began flights to the Far East. SAFE now provides only domestic service between Oslo and five other cities in southern Norway. Its air fleet consists of 2 DC-3's, 1 DC-6A/B, and 4 F-27's.

Wideroe operates regular services in north Norway in collaboration with SAS. The airline receives a small subsidy from the Government. Its air fleet consists of 1 Douglas B-26, 1 Cessna 180, 1 Lockheed L-12A, 1 Republic Seebee, 4 DeHavilland Otters, and 5 Noorduyn Norsemen.

Eight foreign flag carriers offer scheduled service, principally to Oslo. The only scheduled U.S. airline now providing service to Norway is Pan American World Airways, Inc.

Disposal and Reequipment Programs

Wideroe is negotiating with Nord Aviation for the use in late 1962 of an MH-260 Super Broussard twin-engine transport. The carrier would then have an option to acquire two of the MH-262 versions when available in 1963.

GENERAL AVIATION

The most important type of Norwegian general aviation is charter passenger service. In addition to those services offered by the two domestic scheduled airlines, charter flights are operated by 16 specialized companies, including *Fred. Olsens Flyveselskap, Helikopter Service A/S, A/S Norronafly, A/S Solbergfly,* and *A/S Morefly.*

Of the 195 aircraft used in general aviation, 79 are operated by Norway's 27 flying clubs, about half of which have been granted concessions for noncommercial flying instruction.

MARKET POTENTIAL

The market for aircraft for general aviation use is limited to replacements.

The market for helicopters, especially the larger types, does not seem to have been fully exploited. Helikopter Service A/S, Norway's only civilian helicopter company, is considering the purchase of one or two Bell 204B helicopters, which have a payload capacity exceeding 3,000 lbs. At present, the company op-

erates five Bell 47's, each of which has a payload capacity of about 1,200 lbs.

The market for STOL aircraft is small because of their price and Norway's limited number of airstrips.

Aircraft imported by Norway's commercial airlines may enter duty free. All other aircraft and parts may enter without restriction, but a 12-percent import duty is levied.

Norwegian Civil Air Fleet—231

Commercial airlines, total..... 36
- Scandinavian Airlines System (Norwegian registry only)
  - Convair 440..... 6
  - Douglas DC-7C..... 3
  - Douglas DC-8..... 2
  - Sud-Aviation S.E. 210 Caravelle (France)..... 4
- Braathens South American and Far East Airtransport A/S
  - Douglas DC-3..... 2
  - Douglas DC-4..... 1
  - Douglas DC-6A/B..... 1
  - Fokker Friendship F-27 (Netherlands)..... 4
- Wideroe's Flyveselskap A/S
  - Douglas B-26..... 1
  - Cessna 180..... 1
  - Lockheed L-12A..... 1
  - Republic RC-3 Seebee..... 1
  - DeHavilland (Canada) DHC Otter..... 4
  - Noorduyn Norseman (Canada)..... 5

General aviation, total..... 195

Charter..... 68
- A/S Morefly
  - Fairchild Cornell..... 1
  - Grumman Widgeon..... 1
  - Republic RC-3 Seebee..... 2
- A/S Norronafly
  - Cessna 195..... 1
  - Honningstad Finnmark (Norway)..... 1
  - Piper PA-22-108..... 5
  - Piper PA-22 "160"..... 2
  - Wideroe C-5 Polar (Norway)..... 1
- A/S Solbergfly
  - Cessna 180..... 2
  - Cessna 185..... 1
- A/S Sorfly
  - Auster VJ.1 (Great Britain)..... 2
  - Miles Gemini 1-A (Great Britain)..... 1
- A/S Varangfly
  - Cessna 180-D..... 1
  - Cessna 185..... 2
  - Piper Cub L-4H..... 1
- E. Riis Flyrederi A/S
  - Douglas DC-3C..... 1

General aviation, total--Con.
Charter--Con.
Fjellfly, Snorre S. Kjetilson
Cessna 180..... 1
Cessna 195..... 1
Fairchild Cornell..... 1
Noorduyn Norseman (Canada)..... 2
North American Harvard..... 2
Piper Cub L-4H..... 1
Piper PA-22 "150"..... 1
Fjordfly A/S
Cessna 180..... 1
Flyservice A/S
Ae-131..... 1
Meta-Sokol L-40 (Czechoslovakia)..... 1
Fred. Olsens Flyselskap A/S
Riddle C-46R..... 3
H. Bjorum
Beechcraft Baron..... 1
Cessna 172-B..... 1
Cessna 172-G..... 1
Cessna 185..... 2
Helikopter Service A/S
Bell 47..... 4
Agusta-Bell 47J (Italy)..... 1
Agusta-Bell AB 204-B (Italy)..... 1
Nor Flyselskap A/S
Beech AT-11-C18S..... 1
DeHavilland DH Dragon Rapide (Great Britain)... 1
Skandinavisk Aero KZ-VII (Denmark)..... 1
Telemark Flyselskap A/S
Piper Cub Tri-Pacer..... 1
Auster D/6 (Great Britain)..... 1
Thor Solberg Aviation A/S
Cessna 140..... 2
Cessna 170..... 1
Cessna 172..... 1
Cessna 172-A..... 1
Cessna 180..... 2
Cessna 182..... 1
Cessna 310..... 1
Noorduyn Norseman C-64A (Canada)..... 2
Vestlandske Luftfartselskap A/S
Short Sealand IM (Great Britain)..... 1
Flying clubs..... 79
Alesund Flyklubb
Fairchild Cornell..... 1
Askim Flyklubb
Scheibe L-Spatz-55 (glider) (Germany)..... 1
Bardufoss Flyklubb
Fairchild Cornell..... 1
Jodel D. 120 (France)..... 1
Bergens Aero Klubb
Auster 5 (Great Britain)..... 1
Grunau Baby (glider) (Germany)..... 1

General aviation, total--Con.
Flying clubs--Con.
Bodo Flyklubb
Piper Cub..... 1
Scheibe Bergfalke (glider) (Germany)..... 1
Drammen Flyklubb
Fairchild Cornell..... 1
Piper Cub Coupe..... 1
Piper Cub L4-J..... 1
Ae-131..... 1
Morane-Saulnier M.S. 880-B Rallye-Club (France) 1
Mucha-Standard SZD-22C (glider) (Poland)..... 1
Scheibe Bergfalke (glider) (Germany)..... 1
Flyklubben SER-FO
Fairchild Cornell..... 1
Piper Cub J3C-65..... 1
Piper Cub L4-H..... 1
Jodel D. 120 (France)..... 1
Grenland Flyklubb
Fairchild Cornell..... 1
Piper Cub L4-J..... 1
Grunau Baby (glider) (Germany)..... 1
Hattfjelldal Flyklubb
Auster V (Great Britain)..... 1
Jeloy Seilflyklubb
Scheibe Bergfalke (glider) (Germany)..... 1
Scheibe L-Spatz-55 (glider) (Germany)..... 1
Scheibe Specht (glider) (Germany)..... 1
Kirkenes Flyklubb
Piper Cub L4-J..... 1
Kjevik Flyklubb
Fairchild Cornell..... 2
Aviator 2-G..... 1
Norges Tekniske Hogskoles Flyklubb
Fairchild Cornell..... 1
Luscombe 8A..... 1
Hutter H-17 (Germany)..... 1
Scheibe L-Spatz-55 (glider) (Germany)..... 1
Skandinavisk Aero KZ-III (Denmark)..... 1
Norsk Aero Klubb
Elliotts Eon Baby (glider) (Great Britain)..... 2
L-13 Blanik (glider) (Czechoslovakia)..... 1
Scheibe Bergfalke (glider) (Germany)..... 1
Scheibe L-Spatz-55 (glider) (Germany)..... 1
Orland Mil. Flyklubb
Fairchild Cornell..... 1
Os Aero Club
Grunau Baby (glider) (Germany)..... 1
SG-38 (glider)..... 1
Oslo Flyklubb
Piper Cub..... 1
Piper J-3665..... 1
DeHavilland DH 82A Tiger Moth (Great Britain)... 1
Elliotts DFS Olympia (glider) (Germany)..... 2

General aviation, total--Con.
Flying clubs--Con.
Oslo Flyklubb--Con.
Grunau Baby (glider) (Germany)..... 2
Scheibe Bergfalke (glider) (Germany)..... 1
Schweizer (glider)..... 2
Zugvogel IV (glider) (Germany)..... 1
Ringerikes Flyveklubb
Grunau Baby (glider) (Germany)..... 1
SAS Flyklubb
Piper Cub Coupe..... 1
Piper Cub L4-H..... 1
Sandefjard Flyklubb
Piper PA-22-108..... 1
Stavanger Aero Klubb
Fairchild Cornell..... 1
Svalbard Flyklubb
Grunau Baby II-B (glider) (Germany)..... 1
Trondheim Flyklubb
Champion 7EC..... 1
Grunau Baby (glider) (Germany)..... 2
Burgfalke LO-100 (glider) (Germany)..... 1
Mucha-Standard SZD-12A (glider) (Poland)..... 1
Scheibe Bergfalke (glider) (Germany)..... 1
Ullensaker Flyklubb
Fairchild Cornell..... 1
Auster V (Great Britain)..... 1
SG-38 (glider)..... 1
Vaernes Flyklubb
Fairchild Cornell..... 1
Piper Cub L4-J..... 1
Valdres Flyklubb
Grunau Baby (glider) (Germany)..... 1
Piper Cub L4-J..... 1
Scheibe Bergfalke (glider) (Germany)..... 1
Scheibe L-Spatz-55 (glider) (Germany)..... 1
Schleicher 216 K.8 (glider) (Germany)..... 1
SG-38 (glider)..... 1
Volda Flyklubb
Grunau Baby (glider) (Germany)..... 1
SG-38 (glider)..... 1
Private..... 48
Auster VJ. 1 (Great Britain)..... 1
BHT 1..... 1
Cassutt Christie Racer II (Amateur)..... 1
Cessna 140, 170, 172, 175, 180, 195..... 6
DeHavilland DH 82A Tiger Moth (Great Britain)... 2
Fairchild Cornell..... 7
Jodel D. 120-A (France)..... 1
Lockheed L-12A..... 1
Luscombe..... 4
Meta-Sokol L-40 (Czechoslovakia)..... 1
Morane-Saulnier M.S. 885 Super Rallye (France).. 1
Norge C..... 1

General aviation, total--Con.
Private--Con.
Piper Cub, L4-J, L4-H, J-3C, PA-18, PA-22.....14
Republic RC-3 Seebee..... 1
SG-38 (glider)..... 1
Silvaire 8F..... 2
Stinson 108-1..... 1
Taylor Cub J.2..... 1
Westland S-55 (Great Britain)..... 1

Sweden

The Kingdom of Sweden, the third largest country in Western Europe, has an area of more than 170,000 square miles, slightly greater than that of California, and a population of about 7.4 million. The topography consists of mountains and lakes in the north, lowlands in the central region, the Smaland highlands in the south and southeast, and the plains of Skane in the extreme south. Except for Skane and agricultural lands in the central area, Sweden is a country of forests, rivers, and lakes. Because of its great length from south to north, the climate varies considerably. In the north, snow lies on the ground for about 6 months, of the year, but in the south for only about 2 months. Sweden is highly industrialized, its chief manufactures being wood products, iron and steel, machinery, ships, and chemicals.

ROLE OF AIR TRANSPORTATION

Sweden's passenger air traffic, though increasing notably in the past decade, totals less than 1 percent of the country's internal traffic. International passenger air traffic--especially charter flights to vacation spots in southern Europe and the Canary Islands--has grown greatly, at the expense of both ocean carriers and railways. Air freight is a very small part of transportation commerce.

The Royal Ministry of Foreign Affairs formulates international aviation policy; the Royal Board of Civil Aviation administers domestic aviation policy and furnishes technical assistance on international matters. The Minister of Communications acts upon the policy recommendations of the Board.

The Government provides financial assistance to Sweden's two scheduled carriers, Scandinavian Airlines System (SAS) and *Linjeflyg Aktiebolaget* (LIN); it grants subsidies to other aviation companies and aviation activities of local governments; and it has established a Civil Aviation Loan Fund, which is avail-

able to any solvent operator for the purchase of aircraft and aviation equipment. Estimated Government expenditures on subsidies and loans in fiscal year 1962 will be about $5 million.

Sweden has 6 international airports, 25 other major airports (equipped to handle planes of the DC-3 type or larger), and numerous small airfields scattered throughout the country.

Sweden is a member of the International Civil Aviation Organization (ICAO) and its subordinate bodies, such as the European Civil Aviation Conference (ECAC) and the study group Committee on Coordination and Liberalization (COCOLI). The country is a signatory to the following civil aviation conventions: Warsaw (1929), Rome (1933), Chicago (1944), Geneva (1948), and Paris (1956). It also has concluded bilateral agreements with 41 countries, including the United States, and has air traffic rights in 6 others through temporary permits or diplomatic notes.

AIRCRAFT MANUFACTURING

Sweden's aircraft manufacturing firms are *A. B. Malmo Flygindustri* and *Svenska Aeroplan Aktiebolaget* (SAAB). Malmo, a small company which began operations in 1961, has produced three prototypes each of the MFI-9 Junior and the MFI-10 Vipan (Peewit). Full production has begun on the Junior, a two-seat aerobatic light monoplane fitted with a 100 h.p. Continental 0-200 engine. Because of its design and low cost (about $6,000), the Junior is expected to be a good seller in the private aircraft market. It is also being built under contract by *Bolkow-Entwicklungen K. G.* of Munich. The Vipan is a four-seat cabin monoplane built primarily for observation use by the Swedish Army, but it is also suitable for use as a touring and utility aircraft. The last prototype had a 180 h.p. engine.

SAAB, employing about 7,000 people in its aircraft division, produces mainly military aircraft for the Swedish armed forces. The only civilian aircraft now in production is the SAAB 91 Safir, a three or four seater normally employed as a training craft by both civilian and military users and as an observation craft by the armed forces. The latest version of the Safir, the 91D model, has a 180 h.p. Lycoming 0-360-AIA engine. In 1960, 51 Safirs, valued at $1.4 million, were sold, and 37 of these, valued at $1.1 million, were exported. SAAB also assembles the French Sud-Aviation Alouette II helicopter and recently has introduced the Alouette III in Sweden. The company has developed the SAAB 105, a light twin-jet monoplane which can be used for training, reconnaissance, and executive transportation. The engines for the 105 will be supplied by the French firm *Turbomeca S.A.-Brevets Szydlowski.* SAAB intends to produce other civilian-military planes, and a STOL utility aircraft may be in production soon.

Several other firms manufacture airplane parts and accessories. *Svenska Flygmotor AB* produces its own engines and is

also under license to build the Rolls Royce Avon engine. The three major civil maintenance and overhaul facilities are at Bromma, Arlanda, and Bulltofta airports; only Arlanda has equipment to service jets.

AIRCRAFT IN USE

As of March 31, 1962, 561 aircraft were registered in the civil air fleet, and about 525 of these were considered normally operational. The scheduled airlines had 35 aircraft, consisting of 8 Convair 440's, 6 Convair 340's, 1 Convair 990, 8 Douglas DC-3's, 3 Douglas DC-7C's, 3 Douglas DC-8's, and 6 Caravelles. Of the remaining 526 planes, 337 were U.S. built. Most of these aircraft were single engined, and the most numerous makes, in order of popularity, were Piper, Cessna, Auster, DeHavilland, and Klemm.

COMMERCIAL AIRLINES

Service

Sweden has two scheduled airlines, Scandinavian Airlines System (SAS) and *Linjeflyg Aktiebolaget* (LIN). SAS is owned by a consortium of three corporations: *Aktiebolaget Aerotransport* (ABA) of Sweden, *Det Norske Luftfartselskap A/S* of Norway, and *Det Danske Luftfartselskab A/S* of Denmark. ABA provides three-sevenths of the financial support and crew members of SAS, and the other partners each provide two-sevenths. Government financial support and private capital in the parent companies is about even. In addition to its three domestic routes, SAS serves 77 cities in 38 countries on 5 continents. Its services include flights to New York and Los Angeles. In fiscal year 1960-61, SAS carried almost 2 million passengers on its route network of 105,234 miles, 1.5 percent more than in the previous year. In 1960-61, cargo shipments increased from the previous year by 17.5 percent, and mail shipments rose by 12.9 percent.

The air fleet of SAS consists of 7 DC-8's, 9 DC-7C's, 3 DC-6B's, 2 DC-3's, 20 Convair 440's, 2 Convair 990's, and 22 Caravelles. The 990's are leased from Swissair, and SAS leases its DC-3's to LIN, its DC-6B's and 1 Convair 990 to Thai Airways International, and 8 Caravelles to Swissair. SAS has a pooling agreement with Swissair and has financial interests in Thai International and *Guest Aerovias Mexico, S.A.* (Guest).

SAS owns half of LIN, and *Dagens Nyheter* (a Swedish newspaper) and *Airtaco AB* own the other half. LIN provides only domestic service, connecting Stockholm with 15 other cities. It has a fleet of 6 Convair 340's and 8 DC-3's.

Twelve foreign flag carriers offer scheduled service, principally to Stockholm. Among these are three Soviet Bloc airlines: C.S.A. (Czechoslovakia), Malev (Hungary), and Aeroflot

(U.S.S.R.). The only scheduled U.S. airline now providing service to Sweden is Pan American World Airways, Inc.

Disposal and Reequipment Programs

SAS ordered 2 additional Convair 990's for delivery in the summer of 1961 and planned to sell its fleet of 9 DC-7C's to Riddle Airlines, Inc., of Miami. Later, however, SAS canceled both the order and the proposed sale. The tentative plan at present is to use the DC-7C's on the three domestic routes and to sell the Convair 440's now being used. The twenty-third Caravelle ordered by SAS was to arrive sometime in 1962.

GENERAL AVIATION

The most important type of general aviation in Sweden is charter passenger service. About 80,000 passengers took charter tours in 1960, largely vacation trips to southern Europe, the Canary Islands, and North Africa. Charter flights are expected to increase sharply in the next few years. More than 20 Swedish firms offer air charter service, and Transair Sweden AB serves about 60 percent of the charter traffic. SAS has charter flights through Travelair Scandinavia AB, which it controls.

Of the 526 aircraft in general aviation use, about 180 are in charter service; 32 are engaged in prospecting, crop dusting, advertising, air taxi operations, and sightseeing; 115 are used by the 50 flying clubs; and the remainder are used in private and business flying.

Hours and kilometers flown by planes in the four major categories are as follows (data for 1959 are latest available):

Category	Hours flown (In thousands)	Percent	Kilometers flown (In millions)	Percent
All aviation....	180	100	47	100
Scheduled.....	84	47	30	63
Other commercial.....	55	30	11	24
Private.....	28	15	4	9
Instructional	13	8	2	4

MARKET POTENTIAL

SAS's conversion to jets has almost exhausted, for the immediate future, the Swedish market for medium- and long-range high-speed transport aircraft. However, because of its canceled order for 2 Convair 990's, SAS might be interested in purchasing one or two other jets. The piston aircraft made surplus in the

conversion can meet any existing local demand for conventional transport aircraft.

The ruggedness of Swedish terrain enhances the considerable potential market for STOL utility aircraft. Helicopters are already employed extensively. Increasing amounts of communication, navigation, airways, and ground handling equipment of Swedish, U.S., and British manufacture have been purchased as airfield and airway facilities have been expanded. Aircraft and parts may be imported duty free and without restriction.

Swedish Civil Air Fleet—561

Commercial airlines, total..... 35
- Scandinavian Airlines System (Swedish registry only)
  - Convair 440..... 8
  - Convair 990..... 1
  - Douglas DC-7C..... 3
  - Douglas DC-8..... 3
  - Sud-Aviation S.E. 210 Caravelle (France)..... 6
- Linjeflyg AB
  - Convair 340..... 6
  - Douglas DC-3..... 8

General aviation, total..... 526
- Charter services..... 199
  - Svensk Flygtjanst AB
    - Beech D18S..... 2
    - DeHavilland DH Venom Mk 51 (Great Britain)..... 4
    - Fairey Firefly FR Mk 1 (Great Britain)..... 8
    - Fairey Firefly TT Mk 1 (Great Britain)..... 5
    - Fairey Firefly Mk 1 (Great Britain)..... 2
    - Gloster Meteor Mk 7 (Great Britain)..... 2
    - Lockheed 18-56..... 3
    - North American AT-6A..... 2
    - North American AT-6..... 1
  - Svenska Aeroplan Ab
    - Beech 95-55..... 1
    - Beech 95-A55..... 1
    - Helio H-395A..... 1
    - Hughes 269A..... 1
    - Sud-Aviation S.E. 3130 Alouette II (France)..... 2
    - Sud-Aviation S.E. 3160 Alouette III (France)... 1
    - SAAB* 91B Safir (Sweden)..... 1
    - SAAB* 91D Safir (Sweden)..... 1
  - Transair Sweden AB
    - Curtiss Super C-46/CW20-T..... 4
    - Curtiss Super 46C..... 4
    - Douglas DC-6..... 3
    - Douglas DC-6B..... 2
  - AB Nyge-Aero
    - Piper Cub L-4..... 3
    - Piper PA-23 "160"..... 2
    - Piper PA-24 "250"..... 1
    - Piper PA-22 "150"..... 3
    - Piper PA-22-108..... 13

General aviation, total--Con.
Charter services--Con.
AB Nyge-Aero--Con.
Piper PA-22 "135"..... 1
Piper PA-20..... 1
Super Aero 45 (Czechoslovakia)..... 1
Aerobolaget i Boras AB
Fairchild UC-61A..... 1
Fairchild UC-61K..... 1
Noorduyn UC-64A (Canada)..... 1
Piper Cub L-4..... 2
AB Carl Engstrom
Cessna 175B..... 1
Miles Messenger M-38 (Great Britain)..... 1
Piper Cub J3 C-65..... 1
Piper Cub L-4..... 5
Piper PA-18A "150"..... 4
AB Fjallflyg
Stinson Voyager 108..... 2
Jamtlands Aero
Cessna 180D..... 1
Noorduyn UC-64A (Canada)..... 1
Piper PA-18..... 1
Republic RC-3-Seebee..... 1
AB Lapplandsflyg
Agusta-Bell 47J (Italy)..... 1
Bell 47G-2..... 2
Cessna 180D..... 1
Noorduyn UC-64A (Canada)..... 2
Republic RC-3-Seebee..... 1
AB Nord-Flyg
Cessna 172A..... 1
Piper PA-12..... 2
Piper PA-18 "135"..... 1
Piper PA-18 "150"..... 1
Ostermans Aero AB
Agusta-Bell 47G, 47G-2, 47G-3, 47J, 47J-2 (Italy)..... 8
Bell 47D1..... 5
Bell 47J..... 1
Bell 47G..... 1
Bell 47G-3..... 1
Dornier DO 27Q-4 (Germany)..... 2
Dornier DO 28A-1 (Germany)..... 1
Dornier DO 27S1 (Germany)..... 2
Republic RC-3 Seebee..... 1
Sikorsky S-55..... 1
AB Siljansflyg
Cessna 180A..... 1
Champion 7EC..... 3
Piper PA-18A "135"..... 1
Piper PA-18A "150"..... 1
Stinson 108-2..... 1

General aviation, total--Con.
Charter services--Con.
AB Skogsflyg
Cessna 180B..... 2
AB Stockholms Aero
Auster J5G Cirrus Autocar (Great Britain)..... 2
Auster V (Great Britain)..... 1
Skandinavisk Aero KZ-III (Denmark)..... 4
Piper Cub L-4..... 2
Piper PA-22 "150"..... 4
Piper PA-18 "150"..... 3
Piper PA-22 "135"..... 1
Piper PA-22 "160"..... 2
Republic RC-3 Seebee..... 1
F: a Varmlandsflyg
Cessna 172..... 1
AB Avia
Piper Cub L-4..... 1
SAAB*17 (Sweden)..... 2
Stockholms Nya Flygskola
Cessna 172B..... 3
Cessna 150A..... 2
Aero Charter
Fairchild UC-61A..... 1
AB Jordbruksflyg
Airspeed AS10 Oxford (Great Britain)..... 1
Piper PA-18A "135"..... 2
Piper PA-23..... 1
AB Alvsby Flyg
Piper PA-20..... 1
Republic RC-3 Seebee..... 1
F: a Flygtrafik
Piper Cub L-4..... 1
Stinson 108-2..... 1
Gullviks Fabriks Ab
Piper PA-18 "135"..... 1
Piper PA-18A "150"..... 3
Kar-Air AB
Douglas DC-6B..... 1
Solberg Cessna Flyg AB
Cessna 150B..... 1
Cessna 172B..... 1
Cessna 172C..... 1
Cessna 182A..... 1
Cessna 210..... 1
Fairchild UC-61A..... 1
SAAB* 91A Safir (Sweden)..... 1
Skandinavisk Aero KZ-II Sport (Denmark)..... 1
Travelair Scandinavia AB
Beech 95-55..... 1
Beech 65..... 1
Beech B 33..... 1
Piper PA-23..... 1

General aviation, total--Con.
Charter services--Con.
West Aero
Stinson 108-1..... 1
Flying club, private, and business use..... 327
Aero Commander 520..... 1
Auster V, J1-N, Alpha J1-N, J1, Arrow (Great Britain)..... 33
Autogiro C-30A..... 1
Beech D-17S, A-35..... 2
Bucker Bestmann (Germany)..... 2
Piel C.P. 301-S (France)..... 1
Cessna 140; 150, -A, -B; 170-B; 172, -A, -B, -C; 175, -A; 180-A, -B, -C, -D, -E; 182-A, -B, -D; 210, 310..... 47
Champion Aeronca, 7EC..... 2
DeHavilland DH 82A Tiger Moth, Moth Special, Leopard Moth, Hornet Moth, Gipsy Moth, DH 89A Rapide (Great Britain)..... 26
Dornier DO 27Q-4 (Germany)..... 1
Ercoupe 415, -C, -D..... 8
Fairchild 24R-46A, 24W-41A, UC-61A..... 4
Focke Wulf 44J (Germany)..... 12
GV 38..... 5
Jodel D.112, D.119, D.126, DR.1050 (France)..... 7
Klemm Kl 35-B, -D; Kl 107-B, -C (Germany)..... 17
Luscombe 8A..... 3
MFI-9** Junior (Sweden)..... 2
Messerschmitt Me.108 (Germany)..... 1
Miles Falcon M3A, M65 Gemini (Great Britain)... 2
Mooney Mark 20B..... 1
Morane-Saulnier M.S. 880B, M.S. 885 (France)... 4
N.C. 701*** (France)..... 2
Percival Proctor IV, V, Vega Gull (Great Britain)..... 4
Piaggio P.136, L.1 (Italy)..... 1
Piper Cub L-4, L-4H, L-4J, PA-16, PA-18, PA-18A, PA-18/18S, PA-20, PA-22, PA-22-108, PA-22S, PA-22/22S, PA-23, PA-24, J2, J3C, J3C-50, J3C-65, J4A.....112
Rearwin 9000 de Luxe..... 1
Republic RC-3 Seebee..... 8
Ryan Navion A..... 1
SAAB*** 91A Safir, S18A (Sweden)..... 3
Scheibe Bergfalke II/55 (glider) (Germany)..... 2
Schleicher Ka 6CR, K8B (glider) (Germany)..... 2
Skandinavisk Aero KZ-II Sport (Denmark)..... 1
Stark Turbulent-D (Germany)..... 2
Stinson 108-1, V-77..... 3
Taylorcraft BC..... 2
Tipsy B (Belgium)..... 1

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*Svenska Aeroplan Aktiebolaget.
**A.B. Malmo Flygindustri.
***Societe Nationale de Constructions Aeronautiques du Centre.

U.S. Exports of Aeronautical Products to the Nordic Area, 1959-62

(Value in dollars)

Description and country of destination	1959		1960		1961		January-June 1962	
	Number	Value	Number	Value	Number	Value	Number	Value
Aircraft and aircraft engines, total	.....	2,579,483	.....	41,231,135	.....	5,184,421	.....	12,277,629
Commercial and civilian aircraft, total	57	2,131,370	97	40,850,329	104	4,401,718	67	12,006,680
Aircraft 3,000 pounds and over, empty airframe weight	4	1,532,084	12	39,826,084	7	3,356,100	8	11,180,783
Passenger transports, commercial, new:								
3,000-14,999 pounds	.....	.....	.....	.....	.....	.....	1	69,878
Sweden	.....	.....	.....	.....	.....	.....	1	69,878
30,000 pounds and over	.....	.....	7	38,411,084	.....	.....	2	9,400,000
Sweden	.....	.....	7	38,411,084	.....	.....	2	9,400,000
Rotary wing aircraft, commercial, new	2	742,084	.....	.....	.....	.....	.....	.....
Sweden	2	742,084	.....	.....	.....	.....	.....	.....

See footnotes at end of table.

U.S. Exports of Aeronautical Products to the Nordic Area, 1959-62—Con.

(Value in dollars)

Description and country of destination	1959		1960		1961		January-June 1962	
	Number	Value	Number	Value	Number	Value	Number	Value
Commercial and civilian, etc.--Con.								
Aircraft 3,000 pounds--Con.								
Passenger transports--Con.								
Commercial and civilian aircraft, used and rebuilt, including converted	2	790,000	5	1,415,000	7	3,356,000	5	1,710,905
Denmark	.....	.....	1	15,000	3	930,000	2	658,105
Finland	.....	.....	.....	.....	1	661,000	.....	.....
Iceland	1	500,000	1	500,000	1	565,000	1	481,000
Norway	.....	.....	2	600,000	1	732,000	.....	.....
Sweden	1	290,000	1	300,000	1	468,100	2	571,800
Commercial and civilian aircraft under 3,000 pounds	53	599,286	85	1,024,245	97	1,045,618	59	825,897
Utility, 3 places and under, new	13	96,339	15	112,241	41	218,621	22	161,257
Denmark	5	39,355	3	27,294	.....	.....	5	30,820
Finland	.....	.....	1	11,000	2	14,463	.....	.....
Iceland	1	8,131	.....	.....	.....	.....	.....	.....
Norway	.....	.....	2	11,460	.....	.....	10	73,069
Sweden	7	48,853	9	62,487	39	204,158	7	57.368
Utility, 4 places and over, new	21	326,421	54	743,510	43	670,315	27	431,760

Denmark	7	100,280	12	182,523	5	50,525	6	79,208
Finland	.....	.....	1	70,000	.....	.....	.....	.....
Norway	2	45,000	7	84,486	10	193,452	2	24,900
Sweden	12	181,141	34	406,501	28	426,338	19	327,652
Rotary wing, commercial, new	.....	.....	2	97,099	.....	.....	4	82,360
Finland	.....	.....	.....	.....	.....	.....	1	22,360
Sweden	.....	.....	2	97,099	.....	.....	3	60,000
Used and rebuilt, including converted	19	176,526	14	71,395	13	156,682	6	150,520
Denmark	.....	.....	.....	.....	6	94,995	1	9,520
Finland	2	21,150	2	11,100	2	11,950	.....	.....
Iceland	2	24,300	2	23,300	1	18,000	2	6,000
Norway	5	57,982	2	8,000	.....	.....	.....	.....
Sweden	10	73,094	8	28,995	4	31,737	3	135,000
Aircraft engines, including new, used, and rebuilt, total[1]	88	448,113	109	380,806	83	782,703	43	270,949
Reciprocating, new, air-cooled, under 400 horsepower	51	127,472	85	169,129	31	68,848	22	33,588
Denmark	1	4,123	7	20,003	5	8,741	5	8,336
Finland	1	1,300	6	17,317	1	1,992	2	3,277
Iceland	1	1,021	3	11,274	3	8,078	.....	.....
Norway	6	15,080	5	9,564	2	3,623	2	2,487
Sweden	42	105,948	64	110,971	20	46,414	13	19,488

See footnotes at end of table.

U.S. Exports of Aeronautical Products to the Nordic Area, 1959-62--Con.

(Value in dollars)

Description and country of destination	1959		1960		1961		January-June 1962	
	Number	Value	Number	Value	Number	Value	Number	Value
Commercial and civilian, etc.--Con.								
Aircraft engines, etc.--Con.								
Reciprocating, used and rebuilt	37	320,641	24	211,677	52	713,855	21	237,361
Denmark	3	51,595	1	4,896	2	80,000	1	25,000
Finland	1	57,600	.....	.....	2	45,000	4	41,000
Iceland	.....	.....	4	40,098	1	35,000	.....	.....
Norway	12	49,628	10	132,038	18	174,758	5	42,016
Sweden	21	161,818	9	34,645	29	379,097	11	129,345

[1]Number and value of new engines over 400 horsepower are not available by country of destination but are included in total parts and accessories exported from U.S. in table U.S. World Exports of Aeronautical Products.

Source: Report No. FT-410, Part II, U.S. Exports of Domestic and Foreign Merchandise, Bureau of the Census, U.S. Department of Commerce.

U.S. World Exports of Aeronautical Products, 1959-62

(Value in dollars)

Description	1959		1960		1961		January-June 1962	
	Number	Value	Number	Value	Number	Value	Number	Value
Aircraft, and parts and accessories, total	.....	769,015,000	.....	1,329,467,000	.....	1,236,622,000	.....	845,101,000
Commercial and civilian aircraft, total	1,628	152,964,000	2,335	537,109,000	2,461	339,956,000	1,137	218,630,000
Parts and accessories, total	.....	616,051,000	.....	792,358,000	.....	896,666,000	.....	626,471,000
Aircraft engines, reciprocating, new, aircooled, under 400 horsepower	948	2,449,000	1,464	3,716,000	1,575	4,398,000	1,051	2,536,000
Aircraft engines, reciprocating, used and rebuilt	1,250	4,845,000	1,558	10,391,000	1,574	11,684,000	698	5,859,000
Aircraft components, parts, and accessories, not elsewhere classified[1]	.....	608,757,000	....	778,251,000	.....	880,584,000	.....	618,076,000

[1]Includes military aircraft.

Source: Report No. FT-410, Part II, U.S. Exports of Domestic and Foreign Merchandise, Bureau of the Census, U.S. Department of Commerce.

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